Entergy

Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

Gregory G. Hawkins
Director, R&PI
Grand Gulf Nuclear Station
Tel. (601) 437-2443

10CFR50.73

GNRO-2018/00034

August 21, 2018

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Licensee Event Report 2016-002-01, Automatic Actuation of the Reactor Protection System due to B Main Transformer Wiring
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Dear Sir or Madam:

Attached is Licensee Event Report 2016-002-01. This report is being submitted in accordance with 10CFR50.73(a)(2)(iv)(A) as a condition that resulted in the automatic actuation of the reactor protection system.

This letter contains no new commitments. If you have any questions or require additional information, please contact Douglas Neve at 601-437-2103.

Sincerely,

Gregory G. Hawkins
Director, R&PI
Grand Gulf Nuclear Station
GGH/ram

Attachment: Licensee Event Report 2016-002-01

cc: see next page

U.S. Nuclear Regulatory Commission
ATTN: Ms. Lisa M. Regner
Mail Stop OWFN 8 B1
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

U. S. Nuclear Regulatory Commission
ATTN: Mr. Kriss Kennedy, NRR/DORL (w/2)
Regional Administrator, Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

Attachment

Licensee Event Report (LER) 2016-002-01

NRC FORM 366 (02-2018) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Grand Gulf Nuclear Station Unit 1	05000-416	1 OF 3

4. Title

Automatic Actuation of the Reactor Protection System due to B Main Transformer Wiring

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
									N/A	05000N/A
03	29	2016	2016	002	01	08	21	2018	Facility Name	Docket Number
									N/A	05000N/A

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
37	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(iii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Douglas A. Neve, Manager Regulatory Assurance	601-437-2103

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES
A	XFMR	XCT	N/A	Y	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No		N/A	N/A	N/A

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On March 29, 2016, at 1123 Central Daylight Time, Grand Gulf Nuclear Station was operating in Mode 1 and ascending in power at approximately 37 percent rated thermal power when an unplanned uncomplicated automatic reactor SCRAM occurred. A generator lockout was received due to a Main Transformer 'B' Differential Relay Trip which was followed by a turbine control valve fast closure, turbine trip, and reactor SCRAM. The Reactor Protection System and all other safety systems functioned as designed. The direct cause of this event was the premature actuation of the "B" Main Transformer Current Differential Relay (1N41-M703B) that resulted in a main generator lockout, turbine trip, and automatic Reactor SCRAM. The root cause of this event is maintenance fundamental procedures for lifting and landing leads and troubleshooting were not followed by supplemental personnel performing transformer re-wiring project to maintain configuration control. Corrective actions included correcting the transformer wiring issue, revision of procedures, and strengthening maintenance training and qualification processes. This event posed no threat to public health and safety.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station Unit 1	05000-416	2016	002	01

NARRATIVE

PLANT CONDITIONS PRIOR TO THE EVENT

At the time of the event, Grand Gulf Nuclear Station (GGNS) Unit 1 was in Mode 1 and ascending in power at approximately 37 percent rated thermal power. All systems, structures and components that were necessary to mitigate, reduce the consequences of, or limit the safety implications of the event were available. No safety significant components were out of service.

DESCRIPTION

On March 29, 2016, Grand Gulf Nuclear Station (GGNS) was ascending in power for the unit startup following Refueling Outage 20 (RF 20). As reactor power reached approximately 37 percent rated thermal power, a generator lockout was received followed by a turbine control valve fast closure and turbine trip which resulted in an uncomplicated automatic reactor SCRAM. The generator lockout was the result of the Main Transformer 'B' Differential Relay Trip. The reactor protection system (RPS) [JC] and all safety systems functioned as designed and expected.

During the investigation, it was discovered inside the 'B' Main Transformer control cabinet that the high voltage current transformer (CT) [XCT] turns ratio wiring was incorrect. The CT wiring was connected in a manner that produced a turns ratio of 1000:5 versus the designed 2200:5. Due to this erroneous configuration the CT trip setpoint was lower than designed. Therefore, the CT and current differential relay actuation was not an equipment failure but an actual sensed actuation based on an incorrect wiring scheme. Work orders that involved working inside this panel during RF 20 were reviewed to determine when the wiring was altered. No work on CT wiring was intended to be performed during RF 20. Current Transformer ratio wiring work was not within the scope of the transformer rewiring project carried out during RF20. The most likely time the wiring was incorrectly removed and re-landed would have been during the post modification testing which was performed under a work order at the conclusion of the wiring project.

REPORTABILITY

This Licensee Event Report (LER) is being submitted pursuant to Title 10 Code of Federal Regulations (1 0 CFR) 50. 73(a)(2)(iv)(A) for an automatic actuation of the RPS. Telephonic notification was made to the U.S. Nuclear Regulatory Commission (NRC) Emergency Notification System on March 29, 2016, within 4 hours of the event pursuant to 10 CFR 50. 72(b)(2)(iv)(8) and 10 CFR 50.72 (b)(3)(iv)(A) for a valid RPS actuation while the reactor was critical.

CAUSE

Direct Cause: The direct cause of this event was the premature actuation of the "B" Main Transformer Current Differential Relay (1N41-M703B) that resulted in a main generator lockout, turbine trip, and automatic Reactor SCRAM.

Root Cause: The root cause of this event is maintenance fundamental procedures for lifting and landing leads and troubleshooting were not followed by supplemental personnel performing transformer re-wiring project to maintain configuration control.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station Unit 1	05000-416	2016	002	01

NARRATIVE

CORRECTIVE ACTIONS
Corrected the 'B' Main Transformer CT wiring and verified all other wiring in the 'A', 'B', and 'C' Main Transformer control cabinets was correct.

Revised EN-MA-100 Maintenance Fundamentals Program to include an attachment defining the essential knowledge, skills, behaviors and practices personnel need to apply to conduct their work properly.

Conducted a training needs analysis to determine impact on current initial and continuing long range training plans for lesson plans related to maintenance fundamentals.

Implemented a revision to the existing Supervisor qualification oral board process to ensure maintenance fundamentals and the role of the Supervisor as oversight to ensure maintenance fundamentals and the role of the Supervisor as oversight for lifting and landing leads and maintaining high standards and configuration control are adequately addressed.

Verified the training actions that are being tracked outside the corrective action program have been closed with rigor and quality.

SAFETY SIGNIFICANCE
The event posed no threat to the health and safety of the general public or to nuclear safety as RPS performed as designed. All safety systems responded as expected and Operator actions were in accordance with GGNS procedures. No Technical Specification safety limits were challenged or violated. Industrial safety was not challenged, and there was no potential or actual radiological release during the event.

PREVIOUS SIMILAR EVENTS
The Main Transformers were installed in April 2012 to support Extended Power Uprate (EPU). Since the installation, there have been three RPS SCRAMs on main turbine trips associated with CTs prior to this event. These are documented in LER-2012-008-00, LER-2013-01-00, and LER-2015-001-00.

The cause of LER-2015-001-00 was not similar to the event being reported, and the corrective actions would not have prevented the March 29, 2016 reactor SCRAM.

The cause of LER-2012-008-00 and LER-2013-001-00 was inadequate workmanship and work instructions that did not specify the minimum cold clearance of 0.5 inch between the CT and the micarta plate bolts during installation. The corrective actions addressed revising procedures, testing notes, work instructions, and drawings to ensure the minimum 0.5 inch cold clearance is maintained. Although these two events were attributed to inadequate work instruction, the corrective actions would not have prevented the March 29, 2016 reactor SCRAM.